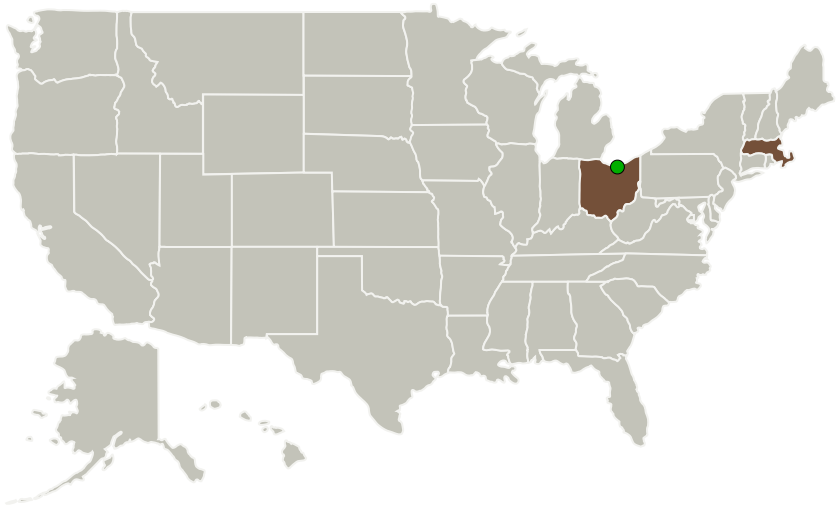
SCONES: Secure Content-Oriented Networking for Exploring Space, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

We envision a secure content-oriented internetwork as a natural generalization of the cache-and-forward architecture inherent in delay-tolerant networks. Using our approach, users can specify their interests or publish content and expect infrastructure to securely match the supply and demand without loss of confidentiality. When doing so, users of a content-oriented network need not concern themselves about the location of the content. Our work addresses the following question: Can nodes in the space network make content-oriented forwarding, caching, and retrieval decisions based on encrypted metadata and encrypted interests (publish/subscribe advertisements) without decrypting them? We believe that recent developments in cryptography in the ares of secure multi-party computation and homomorphic encryption make this possible. We propose to develop fast pragmatic algorithms that can be implemented within the context of IETF Delay-Tolerant Networking and CCSDS Asynchronous Messaging Service protocols that are being evaluated by NASA to support future Space exploration missions.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Scientific Systems Company, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Woburn, Massachusetts
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139428)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Scientific Systems Company, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

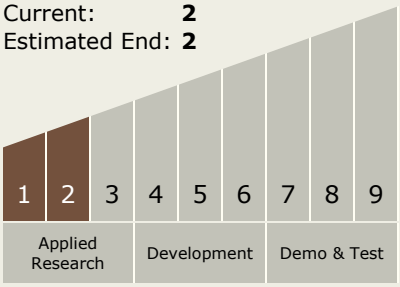
Carlos Torrez

Principal Investigator:

Rajesh Krishnan

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.3 Internetworking
    - TX05.3.3 Information Assurance

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System